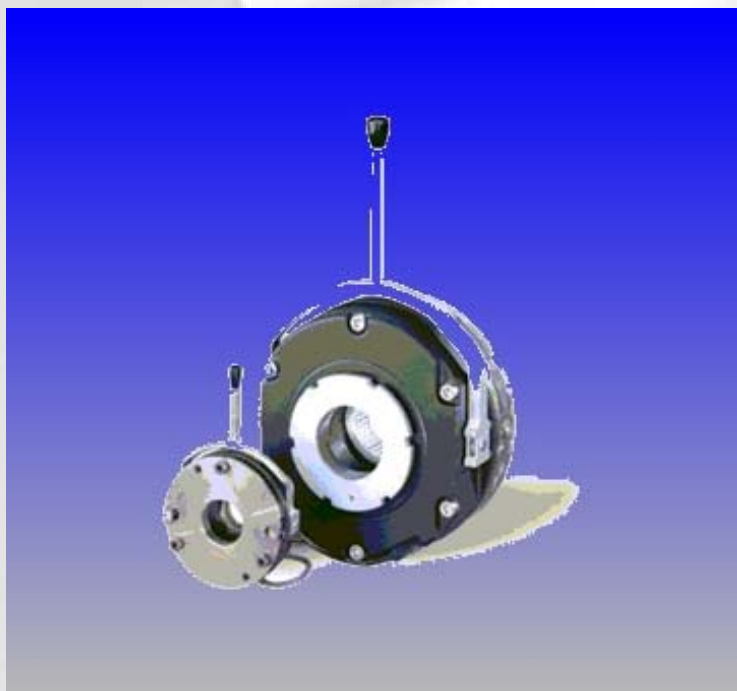




Operating Instructions

○ **Spring-loaded brakes with electromagnetic release**





BFK 458

Spring-loaded brakes with electromagnetic release

1. Product Information and Principle of Operation

BFK 458 spring-applied brakes are single-disk brakes with two friction surfaces. The armature plate (1) is always one of the friction faces. Several friction-locking compression springs (2) generate the brake torque. The brake is released electromagnetically.

The spring-applied brake BFK 458 is made for conversion of mechanical work and kinetic energy into thermal energy. The static brake torque allows to hold loads without rotational speed difference.

During the braking procedure, the rotor (3), which can be shifted axially on the hub (4), is pressed against the friction face via the armature plate (1), by means of the inner and outer compression springs (2). The non-asbestos friction surfaces provide high brake torques at low abrasion. The brake torque transmission between hub (4) and rotor (3) is effected by the use of a gear tooth system.

When the brake is applied, the air gap $s_{LÜ}$ appears between magnetic coil (5) and armature plate (1). The magnetic coil (5) is energised with due DC voltage in order to release the brake. The resulting magnetic flux works against the spring force to draw the armature plate (1) to the magnetic coil (5). Thus, the rotor (3) is discharged from the spring force and can rotate freely. It is possible to obtain smaller brake torques by simply reducing the spring force via the torque adjustment ring (6).

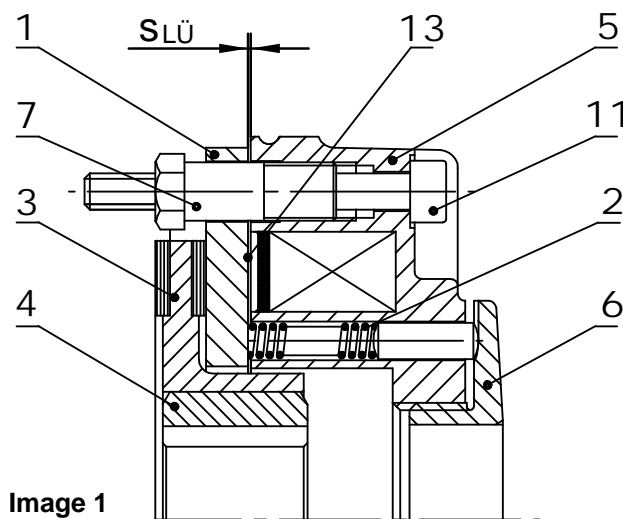


Image 1

- 1 Armature Plate
- 2 Compression Spring
- 3 Rotor
- 4 Hub
- 5 Magnetic Coil
- 6 Torque Adjustment Ring
- 7 Sleeve Bolt
- 11 Fastening Screw
- 13 Brass Plate
- $s_{LÜ}$ Air Gap

2. Product Key

BFK 458 . 06 . E

Construction Form
Adjustable (torque reducible via adjustment)

Size
06, 08, 10, 12, 14, 16, 18, 20, 25

Type
Brake, Spring-Applied Brake



BFK 458

Spring-loaded brakes with electromagnetic release

3. Accessories

Hand Release (8)

The manual release is used to release the brake by hand (e.g. at a power failure) and can be retrofitted. It springs back to the base position automatically after operation. By pulling at the hand release lever, the armature plate is pulled against the magnetic coil, leading to an air gap between rotor and armature plate. The rotor can be turned easily. The brake is released.

Flange (9a), Friction Sheet (9b)

An intermediate flange (9a) can be used if no suitable counter friction face is available. This flange can be fitted by screws on two reference circles. In addition, the flange can hold the dust protection ring.

If a smooth and machined counter surface is available, but suitable as a friction surface (e.g. aluminium), a friction sheet (9b) is used.

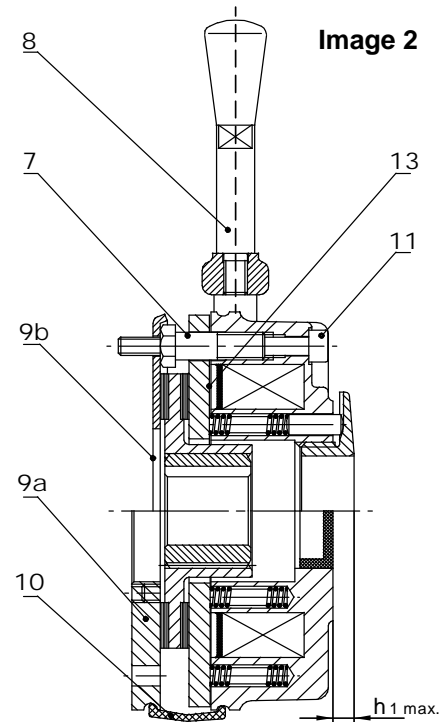
The friction sheet (9b) of rust-proof steel also protects against contact corrosion, even at longer machine downtimes.

Cover Ring (10)

The cover ring protects the brake against the exit or ingress of dust, humidity, dirt, etc. The ring is pulled over the completely assembled brake, with the sealing lips being inserted into the respective grooves. In case that no intermediate flange is used, the counter surface must be equipped with a receiving groove.

Brass Plate (13)

A brass plate can be inserted between armature plate (1) and magnetic coil (5) for fast separation, which leads to reduced incidence times of the brake.



4. Fitting Information

4.1 Installation of Brake

- If no suitable friction surface is available, an intermediate flange (9a) or a friction sheet (9b) is used.
- Draw hub (4) onto shaft [fit feature k_6 up to $\varnothing 50$, more than $\varnothing 50_{m6}$] aufziehen and fix axially by means of a locking ring. The torque transmission takes place via a fitting key connection according to DIN 6885.
- Push rotor (3) onto hub (4).
- Insert the fastening screws (11) through the bore holes in the magnetic coil (5) and screw them into the relevant tapped bores of the counter friction surface. Please remove the assembly clips which protect the sleeve bolts (7) against torsion during transport.
- For safety reasons, please now control the air gap s_{LU} between armature plate (1) and magnetic coil (5) at three points, by using a feeler gauge.



BFK 458

Spring-loaded brakes with electromagnetic release

4. Fitting Information

- The air gap $s_{LÜ}$ is adjusted as follows:
Slightly loosen the fastening screws (11). Then use an open-end wrench for screwing the sleeve bolts (7) into the magnetic coil (5) (for reduction of the air gap) respectively out of the magnetic coil (for enlargement of the air gap). Carefully re-tighten the fastening screws (11). Afterwards please check the air gap $s_{LÜ}$ again, as mentioned above.
- Keep friction surfaces free from grease and oil residue.
- Make electric connection.
- If needed, fix dust protection ring.

4.2 Installation of Hand Release

- The hand release is pre-assembled. For mounting, the dimension s (see *table 1*) between armature plate (1) and disk (12) must be equal at both sides. Never change the hand release alignment later on, not even during adjustment of the air gap $s_{LÜ}$, since this may affect the safety function. Instead, please secure the effected alignment position by some threadlocker.

		Brake Size								
<i>Table 1</i>		06	08	10	12	14	16	18	20	25
	S LÜ [mm]	0,2	0,2	0,2	0,3	0,3	0,3	0,4	0,4	0,5
	S ^{+0,1} [mm]	1	1	1	1,5	1,5	1,5	2	2	2,5

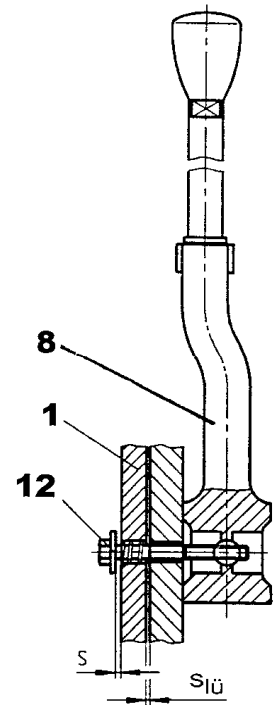


Image 3

4.3 Brake Torque Alteration

- The brake comes with fixed nominal torque M_N . A reduction of the brake torque is possible until max. h_{1max} (image 2): Just unscrew the torque adjustment ring (6) by using a hook wrench. Please see *table 2* for the brake torque alteration values for each raster in the adjustment ring.

Table 2

Brake Size	06	08	10	12	14	16	18	20	25
Brake Torque M_N [Nm]	4	8	16	32	60	80	150	260	400
Reduction per raster [Nm]	0,2	0,35	0,8	1,3	1,7	1,6	3,6	5,6	6,2
h_{1max} [mm]	4,7	4,7	7,6	9,6	11	10	14,9	16,4	17,3

5. Maintenance

Inspection Intervals

Wearout of the friction lining on the rotor results in an enlargement of the air gap $s_{LÜ}$. If the maximum admissible air gap is reached, it has to be re-adjusted to the nominal value.

The degree of abrasion and thus the intervals until necessary re-adjustment of the air gap depend on the operation conditions (switching frequency, number of effected switchings, rotational speed difference).

During inspection, the friction surfaces should be checked for evenness and possible grooves.

Clean the brake from abrasion and dust.



BFK 458

Spring-loaded brakes with electromagnetic release

5. Maintenance

Inspection Intervals -Fortsetzung-

The air gap $s_{LÜ}$ between the armature plate and the magnetic coil must be at zero value when the brake is released. Make sure that the rotor can glide on the hub toothing. For adjustment of the air gap $s_{LÜ}$ please see above.

Brake Size	$s_{LÜ}$ Nominal + 0,1 mm - 0,05 mm [mm]	$s_{LÜ}$ max. Service brake [mm]	$s_{LÜ}$ max. Holding brake [mm]	max. adjustment, admissible abrasion distance [mm]	Rotor [mm]		Overlap of adjustment ring h_1 max. [mm]	Tightening torque	
					min. ¹⁾	max.		Screws [Nm]	Complete lever [Nm]
06	0,2	0,5	0,3	1,5	4,5	6,0	4,7	2,8	2,8
08	0,2	0,5	0,3	1,5	5,5	7,0	4,7	5,5	2,8
10	0,2	0,5	0,3	1,5	7,5	9,0	7,6	9,5	4,8
12	0,3	0,75	0,45	2,0	8,0	10,0	9,6	9,5	4,8
14	0,3	0,75	0,45	2,5	7,5	10,0	11,0	23	12
16	0,3	0,75	0,45	3,5	8,0	11,5	10,0	23	12
18	0,4	1,0	0,6	3,0	10,0	13,0	14,9	23	23
20	0,4	1,0	0,6	4,0	12,0	16,0	16,4	46	23
25	0,5	1,25	0,75	4,5	15,5	20,0	17,3	46	40

1) The friction surface is made for at least 5 adjustments of the brake.

Table 3

6. Electric Connection

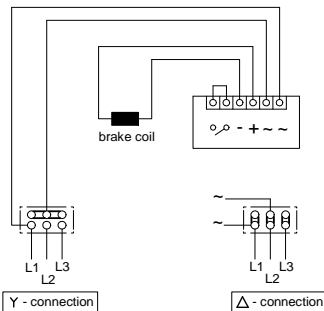
Attention, please: The brake must be in tensionless state during connection to mains supply.

6.1 With Bridge Rectifier

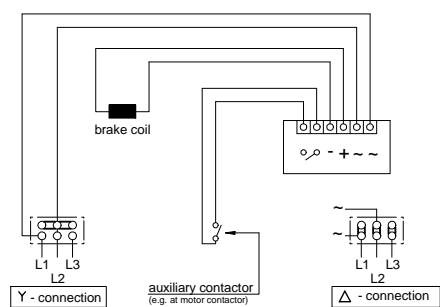
6.1.1 For single-speed AC threephase motors without starting stage

[Direct connection at motor terminal board]

Normal brake engagement [AC single-phase switching]



Fast brake engagement [DC switching]

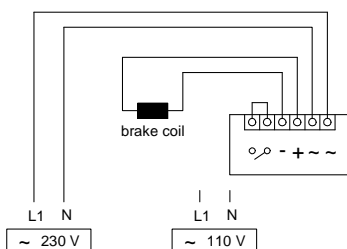


6.1.2 For single-speed AC threephase motors with starting stage, pole-changing motors

[Additional AC voltage connection required]

or for single-phase motors with starting capacitor, operating capacitor and starting relay

Normal brake engagement [AC single-phase switching]

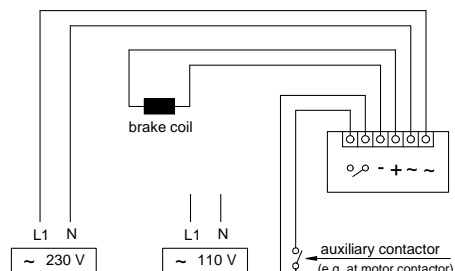


AC single-phase connection voltage
(see name plate of brake)

Motor must be connected at the same time.

No brake release allowed at pole-changing or star-delta switching.

Fast brake engagement [DC switching]



AC single-phase connection voltage
(see name plate of brake)

Motor must be connected at the same time

No brake release allowed at pole-changing or star-delta switching

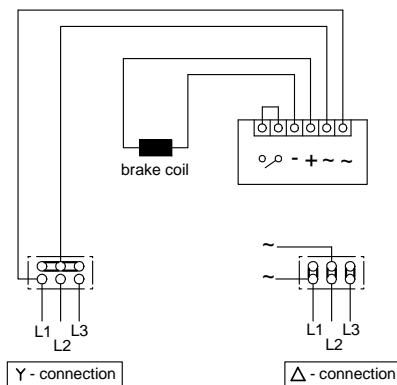


BFK 458
Spring-loaded brakes with electromagnetic release

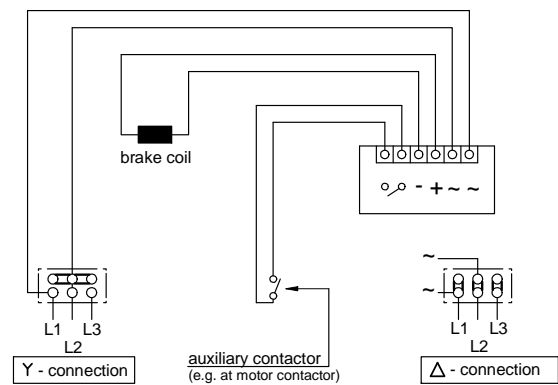
6.2 With One-Way Rectifier

6.2.1 For single-speed AC threephase motors without starting stage [Direct connectino at motor terminal board]

Normal brake engagement [AC single-phase switching]

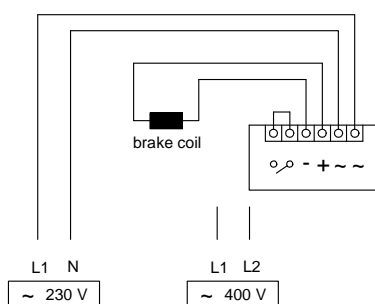


Fast brake engagement [DC switching]



6.2.2 For single-speed AC threephase motors with starting stage, pole-changing motors [Additional AC voltage connection required] or for single-phase motors with starting capacitor, operating capacitor and starting relay

Normal brake engagement [AC single-phase switching]

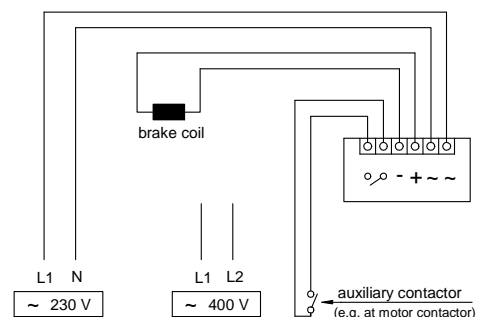


AC single-phase connection voltage
(see name plate of brake)

Motor must be connected at the same time.

No brake release allowed at pole-changing or star-delta switching.

Fast brake engagement [DC switching]



AC single-phase connection voltage
(see name plate of brake)

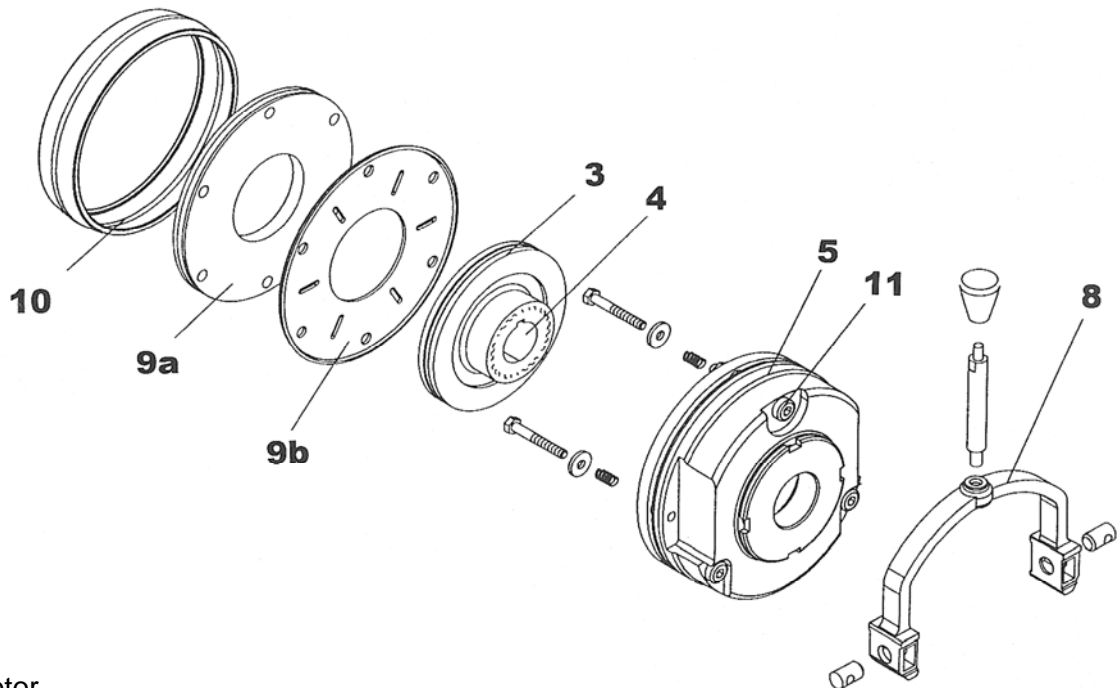
Motor must be connected at the same time.

No brake release allowed at pole-changing or star-delta switching.



BFK 458
Spring-loaded brakes with electromagnetic release

7. Spare Parts List



- | | |
|----|-------------------------|
| 3 | Rotor |
| 4 | Hub |
| 5 | Magnetic Coil, complete |
| 8 | Hand Release, complete |
| 9a | Flange |
| 9b | Friction Sheet |
| 10 | Cover Ring |
| 11 | Set of Screws |

When ordering magnetic coils, please indicate the voltage. When ordering hubs, please indicate in addition the bore hole diameter.

Spare Parts Order Example: e. g. **BFK 458** **06** **Pos.3**
Type Size